



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,706	07/30/2007	Haruo Sugiyama	14875-169US1 C1-A0402P-US	9483
26161	7590	03/10/2010	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			SHIN, DANA H	
			ART UNIT	PAPER NUMBER
			1635	
			NOTIFICATION DATE	DELIVERY MODE
			03/10/2010	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/594,706	<b>Applicant(s)</b> SUGIYAMA ET AL.	
	<b>Examiner</b> DANA SHIN	<b>Art Unit</b> 1635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 4-6 and 8-24 is/are pending in the application.
- 4a) Of the above claim(s) 4-6 and 8-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12-2-2009</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status of Application/Amendment/Claims***

This Office action is in response to the communications filed on December 18, 2009.

Currently, claims 4-6 and 8-24 are pending in the instant application. Newly submitted claims 9-23 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 1-8 as previously presented were found to have no unity of invention as set forth in the Office action dated March 31, 2009, to which applicant elected without traverse claims 1-3 and 7 drawn to a cell growth-suppressing “agent” complementary to SEQ ID NO:1. See the reply filed on April 29, 2009. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 9-22 directed to a “method” are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Accordingly, claim 24 is under examination on the merits in the instant case.

The following rejections are either newly applied or are reiterated and are the only rejections and/or objections presently applied to the instant application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Art Unit: 1635

***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on December 2, 2009 is being considered by the examiner. Note that Citation No. 1 is considered only insofar as its English title and abstract.

***Response to Arguments and Amendments***

**Withdrawn Rejections**

Any rejections not repeated in this Office action are hereby withdrawn.

**New Rejections Necessitated by Amendment**

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al. (US 6,225,051 B1) in view of Ast et al. (*Nucleic Acids Research*, 1997, 25:3508-3513), Mallardo et al. (*Molecular Biology of the Cell*, 2001, 12:3875-3891), Jin et al. (*Cancer Research*, 2003, 63:6154-6157), and Vickers et al. (*The Journal of Biological Chemistry*, 2003, 278:7108-7118).

Note that the transitional term “comprising”, which is synonymous with “including,” “containing,” or “characterized by,” is inclusive or open-ended and does not exclude additional, unrecited elements. See MPEP 2111.

Sugiyama et al. disclose SEQ ID NO:12 as an RT-PCR antisense primer. They teach that WT1 gene expression by RT-PCR assay can be used to detect cancer. It is found that the

Art Unit: 1635

nucleotides 2-18 of the 21-mer SEQ ID NO:12 (TCAAAGCGCCAGCTGGAGTTT) are complementary to the 17-mer SEQ ID NO:1 of the instant application. They teach that WT1 expression was known to indicate or be associated with the presence of cancer cell growth. See columns 3-4; Table 3. Sugiyama et al. do not teach a single-stranded RNA or double-stranded RNA comprising RNA of SEQ ID NO:12.

Ast et al. teach that one can make and use an RNA-based antisense compounds. See the entire reference.

Mallardo et al. teach that one can make and use an RNA-based antisense compounds. See the entire reference.

Jin et al. teach that one can make and use an RNA-based antisense compounds. See the entire reference.

Vickers et al. teach that one can make and use a double-stranded RNA compound such as an siRNA comprising already known antisense oligonucleotide sequence. See the entire reference.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to synthesize an RNA antisense nucleotide molecule of SEQ ID NO:12 of Sugiyama et al.

One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success so as to use the RNA-based antisense nucleic acid to detect the RNA level of WT1 in cancer cell sample or inhibit the WT1 expression level at the RNA level, because SEQ ID NO:12 of Sugiyama et al. that is fully complementary to the entire 17-mer SEQ ID NO:1 was known to hybridize specifically with the WT1 nucleotide sequence, and because making and using RNA-based antisense oligonucleotide compounds (including siRNAs) were

Art Unit: 1635

within the technical grasp of one of ordinary skill in the art at the time the invention was made.

Accordingly, the claimed invention taken as a whole would have been *prima facie* obvious at the time of filing.

### ***Response to Arguments***

Applicant's arguments filed on December 2, 2009 have been fully considered but they are not persuasive. Applicant argues that "There is no reason derivable from Sugiyama to synthesize an RNA antisense nucleotide molecule of SEQ ID NO:12." (original emphasis). In response to applicant's argument addressing "no motivation", it is noted that the *KSR* decision forecloses the argument that a specific suggestion or motivation or teaching is required to support a finding of obviousness. See the precedential opinion rendered by the Board of Patent Appeals and Interferences in *Ex parte Smith*, (Bd. Pat. App. & Interf. Appeal 2007-1925, June 25, 2007) (citing *KSR*, 127 S.Ct. at 1741, 82 USPQ2d at 1396). Applicant can find the copy of the precedential opinion at <http://www.USPTO.gov/web/offices/dcom/bpai/prec/fd071925.pdf>.

In addition, as applicant must be aware, there are only two types of naturally occurring nucleotides: DNA and RNA. It is also art-recognized knowledge and an undeniable scientific fact that DNA sequences in antisense orientation bind and hybridize to complementary DNA sequences, whereas RNA sequences in antisense orientation bind and hybridize to complementary RNA sequences, although RNA/DNA duplex formation is also known. As taught by Sugiyama et al., the DNA-based antisense oligonucleotide sequence of SEQ ID NO:12 is useful for RT-PCR or as a detection probe. Hence, one of ordinary skill in the art in need of an antisense oligonucleotide sequence of SEQ ID NO:12 that binds and hybridizes an RNA

Art Unit: 1635

sequence (e.g., mRNA) for directly targeting the complementary mRNA sequence would have been sufficiently motivated to make an RNA compound comprising SEQ ID NO:12 of Sugiyama et al. in a single-stranded form or a double-stranded form. There is nothing challenging or difficult or unpredictable about synthesizing an RNA molecule having the already known nucleotide sequence disclosed in the art. Further, making and using an RNA-based antisense compound, not DNA-based antisense compound, for various experimental/research purposes were extremely routine in the art as evidenced by the teachings of Ast et al., Mallardo et al., Jin et al., and Vickers et al. Since applicant's arguments do not show the asserted nonobviousness of the RNA containing the nucleotide sequence that was already disclosed in the art, this rejection is hereby reapplied with secondary evidential references.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ware et al. (US 6,232,073 B1, citation of record) in view of Ast et al. (*Nucleic Acids Research*, 1997, 25:3508-3513), Mallardo et al. (*Molecular Biology of the Cell*, 2001, 12:3875-3891), Jin et al. (*Cancer Research*, 2003, 63:6154-6157), and Vickers et al. (*The Journal of Biological Chemistry*, 2003, 278:7108-7118).

Ware et al. teach that the WT1 gene is an oncogene and therefore overexpression of WT1 transcript is an indicator for cancer such as prostate cancer, breast cancer, and leukemia. They disclose a 21-mer SEQ ID NO:30 whose nucleotides 2-18 are complementary to the entire 17 nucleotides of SEQ ID NO:1 of the instant application. They disclose SEQ ID NO:30 as an antisense primer for RT-PCR-based WT1 transcript detection method. See columns 1-2, 10;

Art Unit: 1635

Table 1. Ware et al. do not teach a single-stranded RNA or double-stranded RNA comprising RNA of SEQ ID NO:30.

Ast et al. teach that one can make and use an RNA-based antisense compounds. See the entire reference.

Mallardo et al. teach that one can make and use an RNA-based antisense compounds. See the entire reference.

Jin et al. teach that one can make and use an RNA-based antisense compounds. See the entire reference.

Vickers et al. teach that one can make and use a double-stranded RNA compound such as an siRNA comprising already known antisense oligonucleotide sequence. See the entire reference.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to synthesize an RNA antisense nucleotide molecule of SEQ ID NO:30 of Ware et al.

One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success as to use the RNA-based antisense nucleic acid to detect the RNA level of WT1 in cancer cell sample or inhibit the WT1 expression level at the RNA level, because SEQ ID NO:30 of Ware et al. that is fully complementary to the entire 17-mer SEQ ID NO:1 was known to hybridize specifically with the WT1 mRNA, and because making and using RNA-based antisense oligonucleotide compounds were within the technical grasp of one of ordinary skill in the art at the time the invention was made. Accordingly, the claimed invention taken as a whole would have been *prima facie* obvious at the time of filing.



***Response to Arguments***

Applicant's arguments filed on December 2, 2009 have been fully considered but they are not persuasive. Applicant argues that "There is simply no reason provided in Ware to synthesize an RNA antisense nucleotide molecule of SEQ ID NO:30." (original emphasis). In response to applicant's argument addressing "no motivation", it is noted that the *KSR* decision forecloses the argument that a specific suggestion or motivation or teaching is required to support a finding of obviousness. See the precedential opinion rendered by the Board of Patent Appeals and Interferences in *Ex parte Smith*, (Bd. Pat. App. & Interf. Appeal 2007-1925, June 25, 2007) (citing *KSR*, 127 S.Ct. at 1741, 82 USPQ2d at 1396). Applicant can find the copy of the precedential opinion at <http://www.USPTO.gov/web/offices/dcom/bpai/prec/fd071925.pdf>.

In addition, as applicant must be aware, there are only two types of naturally occurring nucleotides: DNA and RNA. It is also art-recognized knowledge and an undeniable scientific fact that DNA sequences in antisense orientation bind and hybridize to complementary DNA sequences, whereas RNA sequences in antisense orientation bind and hybridize to complementary RNA sequences, although RNA/DNA duplex formation is also known. As taught by Ware et al., the DNA-based antisense oligonucleotide sequence of SEQ ID NO:30 is useful for RT-PCR or as a detection probe. Hence, one of ordinary skill in the art in need of an antisense oligonucleotide sequence of SEQ ID NO:30 that binds and hybridizes an RNA sequence (e.g., mRNA) for directly targeting the complementary mRNA sequence would have been sufficiently motivated to make an RNA compound comprising SEQ ID NO:30 of Ware et al. There is nothing challenging or difficult or unpredictable about synthesizing an RNA molecule having the already known nucleotide sequence disclosed in the art. Further, making

Art Unit: 1635

and using an RNA-based antisense compound (including siRNAs), not DNA-based antisense compound, for various experimental/research purposes were extremely routine in the art as evidenced by the teachings of Ast et al., Mallardo et al., Jin et al., and Vickers et al. Since applicant's arguments do not show the asserted nonobviousness of the RNA containing the nucleotide sequence that was already disclosed in the art, this rejection is hereby reapplied with secondary evidential references.

### ***Conclusion***

No claim is allowed.

This application contains claims 4-6 and 8-23 drawn to inventions nonelected without traverse in the reply filed on April 29, 2009. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1635

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANA SHIN whose telephone number is (571)272-8008. The examiner can normally be reached on Monday through Friday, 7am-3:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fereydoun Sajjadi (Acting SPE) can be reached on 571-272-3311. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dana Shin  
Examiner  
Art Unit 1635

/Dana Shin/  
Examiner, Art Unit 1635